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(54) Program guide signal receiver for television

(57) A device for receiving a digital broadcasting satellite (DBS) signal, includes a controller (6) for generating a first signal for selecting a program guide signal included in the DBS signal and a second signal for selecting one of a plurality of programs which are included in the program guide signal, in response to input of certain key signals; a decoder (10) for decoding the program guide signal in response to the first signal; a storing unit (12) for separating and storing the decoded program guide signal as position data, channel data and video data; a signal compressing unit (20) for compressing the video data corresponding to the second signal; a mixer (22) for mixing the decoded program guide signal as a main screen signal with the compressed video data as a subscreen signal; and a display unit (18) for displaying the signals mixed by the mixer.

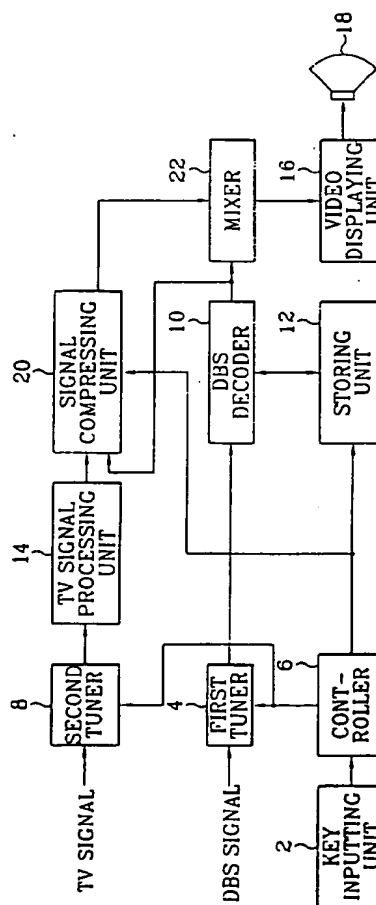


Fig. 3

## Description

The present invention relates to a device for receiving a broadcasting satellite signal. More particularly, it relates to a program guide signal receiver for receiving and processing a program guide signal included in a digital broadcasting satellite (DBS) signal.

Korean Patent Application No. 7525/1995 is incorporated herein by reference for all purposes.

A broadcasting satellite signal receiver is a telecommunication apparatus for receiving a video image of a moving or stationary object transmitted at a remote distance without a significant time delay, transmitted either via an electromagnetic wave or an electrical signal. A television set generally receives and processes a television signal (hereinafter "TV signal"), and it can also receive a digital broadcasting signal (hereinafter "DBS signal") transmitted via a satellite, if a DBS signal receiver is installed in the television set.

The DBS signal includes a DBS video signal and a program guide signal. The program guide signal is a signal for a broadcasting service in which information about program content to be broadcast by a broadcast station is displayed using characters on a screen according to the channel on which the program will be broadcast and the time that it will be broadcast so that a user can freely watch a desired program by using a remote controller, etc. A digital broadcasting signal receiver (DRD 203RW) commercially sold in June 1994 by the RCA company, USA is known to be a product which includes a program guide service function.

Figure 1 is a block diagram illustrating construction of a conventional satellite broadcasting signal receiver.

The conventional satellite broadcasting signal receiver includes a key inputting unit 2 which has a plurality of keys associated with a TV signal receiving mode, a DBS signal receiving mode and a program guide signal receiving mode. When a user depresses one of the keys, a key signal corresponding to the depressed key is input to a controller 6. A remote controller is a representative example of key inputting unit 2.

In the case where the DBS signal receiving mode is set by controller 6, a first tuner 4 receives the DBS signal, and a DBS decoder 10 decodes the received DBS signal. In the case where the TV signal receiving mode is set by controller 6, a second tuner 8 receives the TV signal, and a TV signal processing unit 14 converts the received TV signal into a signal which can be displayed. A storing unit 12 extracts the program guide signal included in the DBS signal, which is decoded by DBS decoder 10 under the control of controller 6, and stores the program guide signal as position data, channel data and graphic data.

The position data indicates the position on the display in which information about a program is displayed. position data is determined by controller 6 according to the order in which the programs are displayed. The position data functions as an interface between controller

6 and a user when the program guide is displayed. For example, if the user, using a remote controller (not shown), causes the cursor to move from program A to program B on a main screen, the position data corresponding to the position of information about program B on the display can be recognized and acknowledged by controller 6. Accordingly, controller 6 can acknowledge a status of the cursor positioned on program B. As a result, the DBS decoder 10 can tune to a channel corresponding to program B, or display channel information on a sub-screen as shown in Figure 2B. The graphic data corresponds to a video picture of the program. That is, it corresponds to data related to a font, a colour and a brightness of the program information to be displayed, as shown in Figure 2A.

A video displaying unit 16 responds to the DBS signal decoded by DBS decoder 10 or to the TV signal processed by the TV signal processing unit 14. Video displaying unit 16 drives a cathode ray tube 18 (hereinafter "CRT") so that the decoded DBS signal or the TV signal is displayed on the CRT 18.

Figures 2A and 2B are drawings illustrating displays of the program guide signal displayed on CRT 18 after being processed by the apparatus shown in Figure 1. Figure 2A is a drawing illustrating the program guide signal displayed in response to the user's selection of the program guide signal receiving mode, and Figure 2B is a drawing illustrating the content of a program displayed in response to the user selecting from the displayed program guide signal, a desired broadcasting program.

Referring to Figures 1 and 2, operations for displaying the received DBS and TV signals on the CRT 18 are described below.

If the TV signal receiving mode is selected, the TV signal received by a second tuner 8 is processed to generate a signal adapted for display by the TV signal processing unit 14, and that signal is then displayed on CRT 18 via a video displaying unit 16.

On the other hand, if the DBS signal receiving mode is selected, the DBS signal received by first tuner 4 is decoded by DBS decoder 10, and the decoded signal then displayed on CRT 18 via video displaying unit 16. At this time, if the user selects the program guide signal receiving mode by means of the key inputting unit 2, controller 6 separates the program guide signal from the DBS signal decoded by DBS decoder 10 and stores the separated data as position data, channel data and graphic data in storing unit 12. Also, after controller 6 reads the position data, channel data and graphic data which represent the program guide signal stored in the storing unit 12, the position data, channel data and graphic data read from storing unit 12 are output to the video displaying unit 16 via DBS decoder 10. Then, the video displaying unit 16 drives CRT 18 to display the program guide signal on CRT 18, which may be displayed in the form of an initial screen, as shown in Figure 2A. Although, it may be represented somewhat differently according to the content of the transmission from

the broadcast station.

If the user selects a program corresponding to a particular channel and time from the program guide signal displayed on the CRT 18, as shown in Figure 2A, with key inputting unit 2, the screen associated with the content of the selected program is displayed on CRT 18. This process is known as confirming the contents of the selected program. For example, as shown in Figure 2B, if channel 2 and a time of 8 o'clock are selected the initial screen shown in Figure 2A is erased and then the screen associated with the content of a "program D" is displayed. The program selected by the user can be the program which is being broadcast at the time the user makes the selection or it can be a program that will be broadcast in the future. In the case of a selected program which is being broadcast at the time of selection, controller 6 controls first tuner 4 to tune to the channel so that the selected program is displayed on the screen. On the other hand, in the case where a program to be broadcast in the future has been selected, after controller 6 reads the video data corresponding to a particular time which is stored in storing unit 12, the video data is displayed on CRT 18. The video data is included in the DBS signal together with the program guide signal.

If confirmation of the content of the one program is completed through the above-described procedure, the user can confirm the content of other programs by utilizing key inputting unit 2. However, the user cannot select the desired program until the program content screen reverts to the initial screen for confirming program content, as shown in Figure 2A, in order to confirm the contents of other programs. Accordingly, in the case of confirming the contents of a plurality of programs, there has been a problem in which the initial screen and the program content screen should be alternately displayed, thereby making it inconvenient for a user to use the apparatus.

It is therefore an aim of preferred embodiments of the invention to provide a broadcasting satellite signal receiver capable of easily confirming the contents of a program from a program guide signal included in a digital broadcasting satellite signal.

According to a first aspect, the invention provides a program guide signal receiver for receiving a broadcast signal which includes a program guide signal containing information including video data about a plurality of programs, said program guide receiver comprising:

a controller for generating a first signal for selecting the program guide signal and a second signal for selecting one of the plurality of programs included in the program guide signal, in response to inputting one or more key signals;

a decoder for decoding said program guide signal selected in response to said first signal and outputting a decoded program guide signal;

a storing unit for separating and storing the information contained in the program guide signal decoded by said decoder;

a compressing unit for compressing the video data corresponding to the program selected based on said second signal;

a mixer for mixing said decoded program guide signal as a main screen signal with said compressed video data as a sub-screen signal; and

a display for displaying said signals mixed by said mixer, wherein said decoded program guide signal is displayed as a main screen signal and said compressed video signal is displayed as a sub-screen signal.

Preferably, said information included in the program guide signal is further comprised of position data, channel data, and graphic data.

The receiver preferably includes a tuner for tuning said DBS signal in response to said first signal.

The receiver may be employed in a device for receiving the broadcast signal, which broadcast signal is a digital broadcasting satellite (DBS) signal which includes the program guide signal.

The receiver may be employed in a device for receiving the broadcast signal, which broadcast signal is a digital broadcasting satellite (DBS) signal which includes the program guide signal which includes information identifying a plurality of programs and a digital video signal including the plurality of programs.

The second signal is preferably arranged for selecting one of the plurality of programs included in the digital video signal and identified by the program guide signal, in response to inputting certain key signals.

Preferably, the information separated and stored in the storing unit includes video data; the compressing unit compresses the digital video signal corresponding to the program selected according to said second signal, and selectively compresses said video data stored in said storing unit when a digital video signal corresponding to the program selected according to said second signal is not present within the digital video signal of the DBS signal; the mixer mixes said decoded program guide signal as a main screen signal, with one of said digital video signal corresponding to the program selected according to said second signal compressed by said compressing unit and said video data stored in said storing unit and selectively compressed by said compressing unit as a sub-screen signal; and the display displays said signals mixed by said mixer, wherein said decoded program guide signal is displayed as a main screen signal and said one of said video signal and said video data compressed by said compressing unit is displayed as a sub-screen signal.

Preferably, the receiver is for use in a device for re-

ceiving a TV signal including a first plurality of programs and a digital broadcasting satellite (DBS) signal including the program guide signal including information identifying programs of at least one of the first plurality of programs and a second plurality of programs and a digital video signal including the second plurality of programs, wherein: the controller is arranged for generating the first signal for selecting the program guide signal included in the DBS signal and the second signal for selecting a program from one of the first and second plurality of programs included in the TV signal and the digital video signal, respectively, in response to inputting certain key signals; the information separated and stored by the storing unit includes video data; the compressing unit is arranged for compressing one of the first plurality of programs of the TV signal which corresponds to the program selected based on said second signal, compressing one of the second plurality of programs of the digital video signal which corresponds to the program selected based on said second signal, and compressing said video data stored in said storing unit when a program corresponding to said second signal is not present in the TV signal and the digital video signal; and the mixer is arranged for mixing said decoded program guide signal as the main screen signal with one of the TV signal, the digital video signal, and said video data stored in said storing unit, which corresponds to said second signal and which is selectively compressed by said compressing unit, as a sub-screen signal.

Said mixer preferably mixes said decoded program guide signal with the TV signal if the program selected by said second signal is present in the TV signal, with the digital video signal if the program selected by said second signal is present in the digital video signal, and with the video data if the program is not present in either the TV signal or the digital video signal.

Preferably, a second tuner is provided for tuning said TV signal in response to said second signal generated by said controlling unit.

According to a second aspect of the invention, there is provided a method for operating a program guide signal receiver employed in a device for receiving a TV signal including a first plurality of programs and a digital broadcasting satellite (DBS) signal including a program guide signal including information identifying a second plurality of programs and a digital video signal including the second plurality of programs and a digital video signal including the second plurality of programs, said method comprising the steps of:

generating a first signal for selecting the program guide signal included in the DBS signal;

generating a second signal for selecting a program from one of the first and second plurality of programs included in the TV signal and the digital video signal, respectively, in response to inputting certain key signals;

decoding the program guide signal in response to said first signal and outputting a decoded program guide signal;

separating and storing the information included in said decoded program guide signal, wherein said information includes video data;

compressing by means of a compressing unit one of (i) one of the first plurality of programs of the TV signal which corresponds to the program selected based on said second signal, (ii) one of the second plurality of programs of the digital video signal which corresponds to the program selected based on said second signal, and (iii) said video data stored in said storing unit when a program corresponding to said second signal is not present in the TV signal and the digital video signal;

mixing by means of a mixer said decoded program guide signal as a main screen signal with said one of the TV signal, the digital video signal, and said video data stored in said storing unit, which corresponds to said second signal and which is selectively compressed by said compressing unit, as a sub-screen signal; and

displaying said signals mixed by said mixer.

According to a third aspect of the invention, there is provided a broadcast signal receiver in which a program guide signal is included in a broadcast signal for display on a main screen, wherein a selection signal for confirming program content from a displayed program guide signal is arranged to be input to cause the content of a selected program to be displayed on a sub-screen of the main screen.

The receiver of the third aspect may further comprise any feature, or combination of features from the accompanying description, claims, abstract or drawings.

According to another aspect of the invention, there is provided a satellite broadcast signal receiver, in which a program guide signal is included in a digital broadcasting satellite signal for display on a main screen, wherein a selection signal for confirming program content from a displayed program guide signal is arranged to be input, to cause the content of a selected program to be displayed on a sub-screen of the main screen.

Moreover, there is provided a broadcasting satellite signal receiver according to a further aspect of the present invention, in which a signal associated with the program content included in a DBS signal or a TV signal is displayed on the sub-screen, in the case that the signal associated with the program content selected for confirmation is included in the DBS signal or the TV signal presently being received. On the other hand, according to a further aspect, in the case where a selected pro-

of the case in which a user selects a program guide signal receiving mode, in order to prevent obscurity of the present invention.

Figure 3 is a block diagram illustrating a broadcasting satellite signal receiver according to an embodiment of the present invention.

Figure 4 illustrates the program guide signal displayed on CRT 18 after being processed by the receiver shown in Figure 3. Figure 4A represents a form of the program guide signal, and Figure 4B represents the program content included in the program guide signal.

The broadcasting satellite signal receiver shown in Figure 3 is set to the program guide receiving mode when the program guide selection signal is received from the key inputting unit 2. Thus, the controller 6 enables first tuner 4 to be tuned so that the DBS signal is decoded by DBS decoder 10. At this time, the program guide signal included in the DBS signal decoded by DBS decoder 10 is displayed on CRT 18 via video displaying part 16, as shown in Figure 4A. In other words, the program guide signal is displayed on a main screen, and the program content is displayed on a sub-screen. In this case, as shown in Figure 4A, a void space is displayed on the sub-screen since a program is not selected. Controller 6 displays the program guide signal in the form shown in Figure 4A. At the same time, controller 6 extracts the program guide signal included in the DBS signal to thereby separate and store the program guide signal as position data, channel data and graphic data

Figure 1 is a block diagram illustrating a conventional broadcasting satellite signal receiver:

Figure 3 is a block diagram illustrating a broadcasting satellite signal receiver according to an aspect of the present invention; and

Figure 4A and 4B are drawings illustrating the program guide signal processed by the receiver shown in Figure 3.

The following description is given within the limits

in storing unit 12.

Next, if the user utilizes key inputting unit 2 to select a channel and a time with the aid of the program guide signal displayed on the CRT 18 as in the form shown in Figure 4A, a screen showing the contents of the selected program is displayed on the sub-screen of CRT 18. For example, if channel 2 and 8 o'clock are selected, the content screen for "program D" is displayed on the sub-screen, as shown in Figure 4B.

A program which is being broadcast or which will be broadcast in the future may be selected by the user. If the program being broadcast is selected by the user, controller 6 controls first tuner 4 or second tuner 8 to tune to the channel so that the selected program is displayed. In other words, in the case where the selected program is included in the DBS signal, first tuner 4 is tuned and in the case where the selected program is included in the TV signal, second tuner 3 is tuned.

On the other hand, in the case where the program that will be broadcast in the future is selected, controller 6 reads video data relating to a particular time which is stored in storing unit 12 and then displays video data on the sub-screen of CRT 18. This video data represents the program content and is data which was previously stored as the program contents in the storing unit 12. The information displayed in the subscreen is generally character data, i.e., data corresponding to a plot, a performer or the viewing time of the program. However, the specific information displayed in the subscreen depends on the type of signal transmitted by the sender. Accordingly, a still image can be displayed in the subscreen for a program which is to be broadcast in the future.

As discussed above, the user watches the displayed program included in the program guide signal and then selects the desired program, such that the program guide signal is displayed on the main screen and the desired program is displayed on the sub-screen of the CRT 18, thereby making it easy for the user to confirm the contents of a plurality of programs. That is, the present invention provides the advantage that the user can confirm the contents of a plurality of programs on the screen of the program guide signal without repeatedly confirming the program guide signal and the program contents.

While there have been illustrated and described what are considered to be the preferred embodiments of the present invention, it will be understood by those skilled in the art that various changes and modifications may be made, and equivalents may be substituted for elements thereof without departing from the scope of the present invention.

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (in-

cluding any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

## Claims

1. A program guide signal receiver for receiving a broadcast signal which includes a program guide signal containing information including video data about a plurality of programs, said program guide receiver comprising:

a controller (6) for generating a first signal for selecting the program guide signal and a second signal for selecting one of the plurality of programs included in the program guide signal, in response to inputting one or more key signals;

a decoder (10) for decoding said program guide signal selected in response to said first signal and outputting a decoded program guide signal;

a storing unit (12) for separating and storing the information contained in the program guide signal decoded by said decoder (10);

a compressing unit (20) for compressing the video data corresponding to the program selected based on said second signal;

a mixer (22) for mixing said decoded program guide signal as a main screen signal with said compressed video data as a sub-screen signal; and

a display (18) for displaying said signals mixed by said mixer (22), wherein said decoded program guide signal is displayed as a main screen signal and said compressed video signal is dis-



played as a sub-screen signal.

2. The program guide signal receiver as claimed in claim 1, wherein said information included in the program guide signal is further comprised of position data, channel data, and graphic data. 5
3. The program guide signal receiver as claimed in claim 1 or 2, further comprising a tuner (4) for tuning said DBS signal in response to said first signal. 10
4. A program guide signal receiver according to any of the preceding claims, wherein the receiver is employed in a device for receiving the broadcast signal, which broadcast signal is a digital broadcasting satellite (DBS) signal which includes the program guide signal. 15
5. A program guide signal receiver according to claim 1, 2 or 3 wherein the receiver is employed in a device for receiving the broadcast signal, which broadcast signal is a digital broadcasting satellite (DBS) signal which includes the program guide signal which includes information identifying a plurality of programs and a digital video signal including the plurality of programs. 20 25
6. A receiver according to claim 5, wherein the second signal is arranged for selecting one of the plurality of programs included in the digital video signal and identified by the program guide signal, in response to inputting certain key signals. 30
7. A receiver according to claim 6, wherein: the information separated and stored in the storing unit (12) includes video data; the compressing unit (20) compresses the digital video signal corresponding to the program selected according to said second signal, and selectively compresses said video data stored in said storing unit (12) when a digital video signal corresponding to the program selected according to said second signal is not present within the digital video signal of the DBS signal; the mixer (22) mixes said decoded program guide signal as a main screen signal, with one of said digital video signal corresponding to the program selected according to said second signal compressed by said compressing unit (20) and said video data stored in said storing unit (12) and selectively compressed by said compressing unit (20) as a sub-screen signal; and the display (18) displays said signals mixed by said mixer (22), wherein said decoded program guide signal is displayed as a main screen signal and said one of said video signal and said video data compressed by said compressing unit (20) is displayed as a sub-screen signal. 35 40 45 50 55
8. A program guide signal receiver according to claim

4, for use in a device for receiving a TV signal including a first plurality of programs and a digital broadcasting satellite (DBS) signal including the program guide signal including information identifying programs of at least one of the first plurality of programs and a second plurality of programs and a digital video signal including the second plurality of programs, wherein:

the controller (6) is arranged for generating the first signal for selecting the program guide signal included in the DBS signal and the second signal for selecting a program from one of the first and second plurality of programs included in the TV signal and the digital video signal, respectively, in response to inputting certain key signals:

the information separated and stored by the storing unit (12) includes video data:

the compressing unit (20) is arranged for compressing one of the first plurality of programs of the TV signal which corresponds to the program selected based on said second signal, compressing one of the second plurality of programs of the digital video signal which corresponds to the program selected based on said second signal, and compressing said video data stored in said storing unit (12) when a program corresponding to said second signal is not present in the TV signal and the digital video signal; and

the mixer (22) is arranged for mixing said decoded program guide signal as the main screen signal with one of the TV signal, the digital video signal, and said video data stored in said storing unit (12), which corresponds to said second signal and which is selectively compressed by said compressing unit (20), as a sub-screen signal.

9. The receiver as claimed in claim 8, wherein said mixer (22) mixes said decoded program guide signal with the TV signal if the program selected by said second signal is present in the TV signal, with the digital video signal if the program selected by said second signal is present in the digital video signal, and with the video data if the program is not present in either the TV signal or the digital video signal.
10. The receiver as claimed in claim 9, further comprising a second tuner (8) for tuning said TV signal in response to said second signal generated by said controlling unit (6).

11. A method for operating a program guide signal receiver employed in a device for receiving a TV signal including a first plurality of programs and a digital broadcasting satellite (DBS) signal including a program guide signal including information identifying a second plurality of programs and a digital video signal including the second plurality of programs and a digital video signal including the second plurality of programs; said method comprising the steps of:

generating a first signal for selecting the program guide signal included in the DBS signal;

generating a second signal for selecting a program from one of the first and second plurality of programs included in the TV signal and the digital video signal, respectively, in response to inputting certain key signals;

decoding the program guide signal in response to said first signal and outputting a decoded program guide signal;

separating and storing the information included in said decoded program guide signal, wherein said information includes video data;

compressing by means of a compressing unit one of (i) one of the first plurality of programs of the TV signal which corresponds to the program selected based on said second signal, (ii) one of the second plurality of programs of the digital video signal which corresponds to the program selected based on said second signal, and (iii) said video data stored in said storing unit when a program corresponding to said second signal is not present in the TV signal and the digital video signal;

mixing by means of a mixer said decoded program guide signal as a main screen signal with said one of the TV signal, the digital video signal, and said video data stored in said storing unit, which corresponds to said second signal and which is selectively compressed by said compressing unit, as a sub-screen signal; and

displaying said signals mixed by said mixer.

12. A broadcast signal receiver in which a program guide signal is included in a broadcast signal for display on a main screen, wherein a selection signal for confirming program content from a displayed program guide signal is arranged to be input to cause the content of a selected program to be displayed on a sub-screen of the main screen.

13. A receiver according to claim 12, further comprising any feature, or combination of features, from the accompanying description, claims, abstract or drawings.

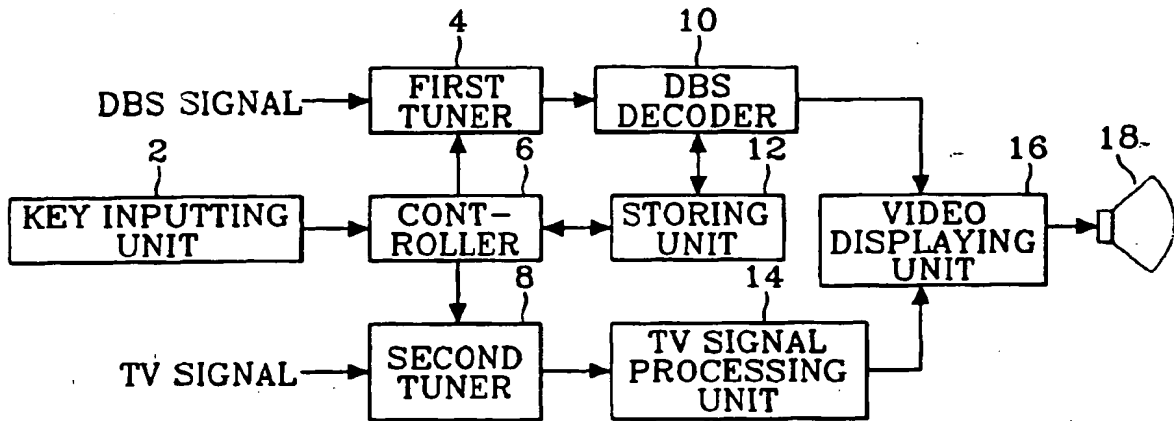


FIG. 1

	7 O'CLOCK	8 O'CLOCK	• •	10 O'CLOCK
CHANNEL 1	PROGRAM A	PROGRAM B	•	PROGRAM E
CHANNEL 2	PROGRAM C	PROGRAM D	•	PROGRAM F
•	•	•	•	•
•	•	•	•	•
•	•	•	•	•
CHANNEL 5	PROGRAM H		•	PROGRAM G

FIG. 2A

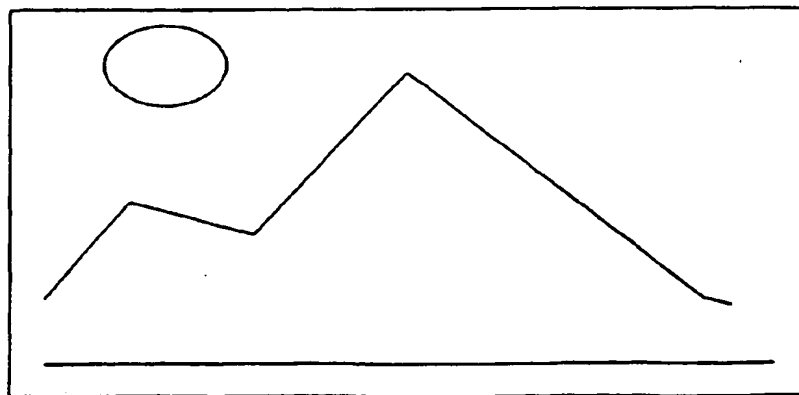


FIG. 2B

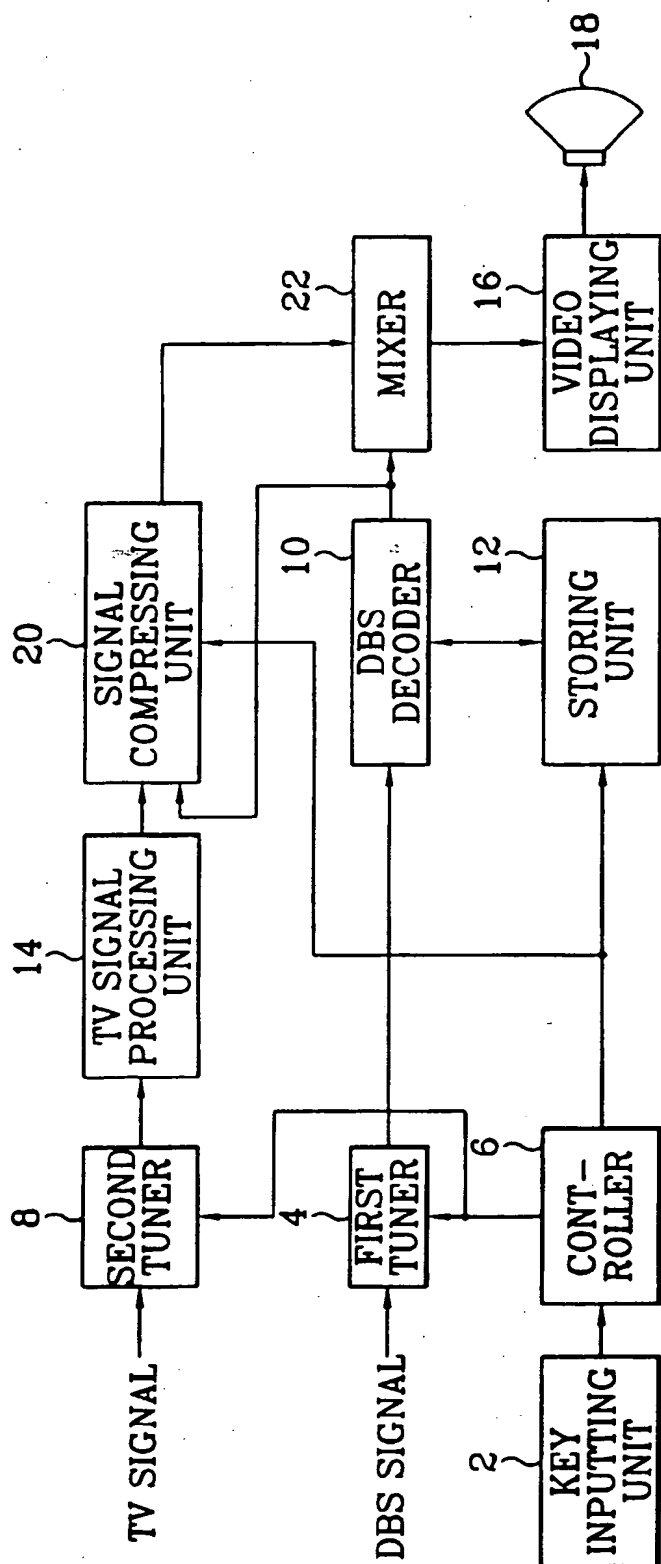


Fig. 3

	7 O'CLOCK	8 O'CLOCK	• •	10 O'CLOCK
CHANNEL 1	PROGRAM A	PROGRAM B	• • •	PROGRAM E
CHANNEL 2	PROGRAM C	PROGRAM D		PROGRAM F
• • •	• • •	• • •		•
CHANNEL 5	PROGRAM H			

FIG. 4A


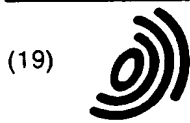
	7 O'CLOCK	8 O'CLOCK	• •	10 O'CLOCK
CHANNEL 1	PROGRAM A	PROGRAM B	• • •	PROGRAM E
CHANNEL 2	PROGRAM C	PROGRAM D		PROGRAM F
• • •	• • •	• • •		•
CHANNEL 5	PROGRAM H			

FIG. 4B

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### (54) Program guide signal receiver for television

(57) A device for receiving a digital broadcasting satellite (DBS) signal, includes a controller (6) for generating a first signal for selecting a program guide signal included in the DBS signal and a second signal for selecting one of a plurality of programs which are included in the program guide signal, in response to input of certain key signals; a decoder (10) for decoding the program guide signal in response to the first signal; a stor-

ing unit (12) for separating and storing the decoded program guide signal as position data, channel data and video data; a signal compressing unit (20) for compressing the video data corresponding to the second signal; a mixer (22) for mixing the decoded program guide signal as a main screen signal with the compressed video data as a subscreen signal; and a display unit (18) for displaying the signals mixed by the mixer.

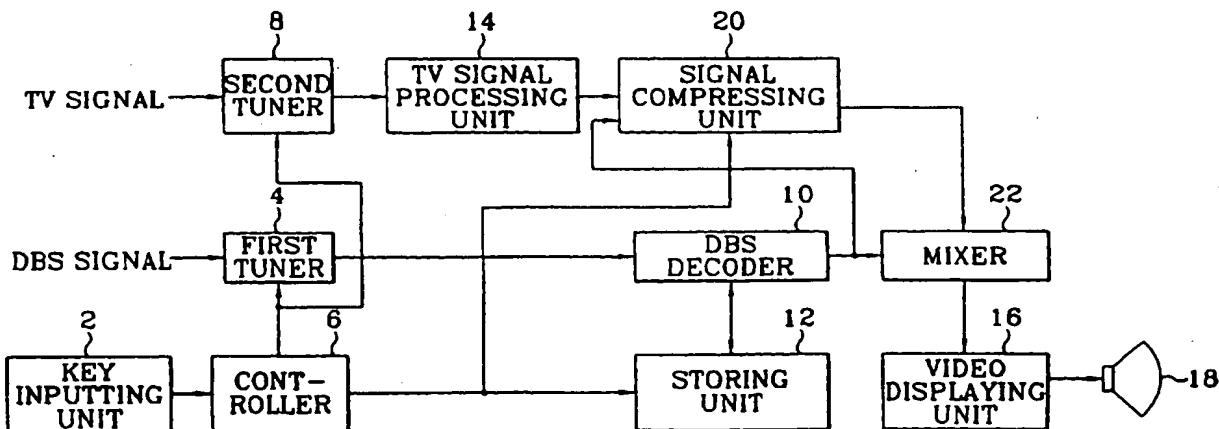


Fig. 3

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EP 96 30 2271

DOCUMENTS CONSIDERED TO BE RELEVANT			
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Place of search THE HAGUE		Date of completion of the search 20 July 1999	Examiner Yvonnet, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone ✓ : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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